NON-PUBLIC?: N
ACCESSION #: 9306110217
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Byron, Unit 2 PAGE: 1 OF 3

DOCKET NUMBER: 05000455

TITLE: Unit 2 Reactor Trip due to Turbine Trip due to Overspeed
Trip Actuation caused by a Spiking Power Supply
EVENT DATE: 05/11/93 LER #: 93-003-00 REPORT DATE:

OTHER FACILITIES INVOLVED: None DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 97

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: T. Milligan, System Engineer TELEPHONE: (815) 234-5441
Ext. 2149
W. Kouba, Unit 2 Operating Engineer
Ext. 2218

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: JJ COMPONENT: JX MANUFACTURER: W120
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 22:38 on May 11, 1993, a Turbine Emergency Trip Oil Header Pressure Low Alert was received on Byron Unit 2, followed immediately by a Reactor Trip initiated by Turbine trip above P-8 (30% power). The Reactor Trip was initiated by a loss of Electro-Hydraulic fluid pressure in the Emergency Trip header.

The cause of the loss of pressure in the Emergency Trip header was a spurious actuation of the Overspeed Trip Relay due to a spiking power supply.

The immediate corrective action was to replace the faulty power supply board.

This event is reportable per 10CFR50.73(a)(2)(iv), any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature including the Reactor Protection System.

(1004R/VS-2)

END OF ABSTRACT

A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date/Time 05-11-93 /2238

Unit 2 MODE 1 - Normal Operations Rx Power 97.5%

RCS AB! Temperature/Pressure NOP / NOT

B. DESCRIPTION OF EVENT:

At 22:38 on May 11, 1993, a Turbine Emergency Trip Oil Header Pressure Low Alert was received on Byron Unit 2, followed immediately by a Reactor Trip initiated by Turbine Trip above P-8 (30% power). The Reactor Trip was initiated by a loss of Electro-Hydraulic (EH) JJ! fluid pressure in the Emergency Trip header when the 20/ET valve was opened by a signal to its solenoid operator. No Sequence of Events Recorder (SER) alarm was received indicating the cause of the loss of Emergency Trip Header pressure. systems reacted as expected. A Feedwater (FW) SJ! Isolation signal occurred and the Auxiliary Feedwater (AF) BA! pumps autostarted on a Low-Low Steam Generator Level signal. The Reactor was safely shut down and maintained in Mode 3 (Hot Standby) per operating procedures. All operator actions were appropriate for this event.

This event is reportable per 10CFR50.73(a)(2)(iv), any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature including the Reactor Protection System.

C. CAUSE OF EVENT:

After the Reactor Trip, during troubleshooting, several Electrical Overspeed Trip annunciator alarms were received in the Main Control Room. The alarms were random and could not be tied to any event or sequence of events when they were received. Since the alarms were fed from the Overspeed Trip-2 (OST-2) relay in the 20/ET circuit,

strip chart recorders were attached to the 20/ET circuit to determine the source of the Electrical Overspeed Trip alarms. The next time the alarm was received, it toggled for thirty minutes, allowing troubleshooting of the circuit. The strip chart recorders revealed an OST-2 relay closure. The instrument maintenance technicians began troubleshooting the OST-2 relay circuit and found a spiking 15 VDC power supply. They verified that when a spike of 19 VDC or greater occurred, an overspeed alarm was received and the 20/ET solenoid actuated.

Further testing and investigation revealed that the OST-2 relay was occasionally able to open the 20/ET valve without giving an SER alarm signal due to a gap difference in the relay contacts. This would account for not receiving an SER alarm prior to losing EH pressure when the turbine tripped. The contacts are on the same rocker arm, but if pressure is applied quickly, only the 20/ET contact would make up a circuit.

In summary, investigation of the A Train Overspeed Protection Circuit (20/ET) eventually revealed a faulty power supply. The power supply was found to be spiking to 22 VDC (it should normally be 15 VDC). These spikes caused the Overspeed Trip-2 relay (OST-2) of the 20/ET circuit to close and actuate the 20/ET dump valve, causing a Reactor Trip/Turbine Trip above 30% power.

(1004R/VS-3)

D. SAFETY ANALYSIS:

There were no safety consequences as a result of this event. All ESF systems responded as expected and the unit was safely shutdown.

E. CORRECTIVE ACTIONS:

The immediate corrective action to the problem was to replace the faulty power supply board.

A Problem Analysis Data Sheet (PADS) 93-020 was written to determine the frequency of the changeout of the power supply boards. It will also address possible changes to the 20/ET circuit design for example, to include a zener diode in parallel with the power supply to prevent voltage spiking. NTS Item # 4551809300300 is tracking PADS 93-020.

The OST-2 relay was replaced due to the gap difference in the contacts. The gap difference would not have been a concern had an actual overspeed occurred since a steady signal to the OST-2 relay would have picked up both contacts.

F. RECURRING EVENTS SEARCH AND ANALYSIS

a) EVENT SEARCH (DIR, LER)

A search was conducted and
no related events have occurred at
Byron.

b) INDUSTRY SEARCH (OPEX's NPRDS)

No NPRDS items were found. Arkansas Nuclear One had a similar problem with their overspeed circuit. They were contacted during the investigation and their problem stemmed from an electrical ground, not a faulty power supply.

c) NWR

NWR B73407 was written in 2/90 against a defective power supply board on Unit 1.

d) ANALYSIS

No trend is identified at this time.

G. COMPONENT FAILURE DATA

Manufacturer Nomenclature Model # MFG Part #

Westinghouse Power Supply B122 B106-B

(1004R/VS-4)

Commonwealth Edison
Byron Nuclear Station
4450 North German Church Road
Byron, Illinois 61010

June 4, 1993

LTR: BYRON 93-0274
FILE: 3.03.0800 (1.10.0101)

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Dear Sir:

The Enclosed Licensee Event Report from Byron Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73 (a)(2)(iv).

This report is number 93-003; Docket No. 50-455.

Sincerely,

G.K. Schwartz
Station Manager
Byron Nuclear Power Station

GKS/DK/ng

Enclosure: Licensee Event Report No. 93-003

cc: J. Martin, NRC Region III Administrator
NRC Senior Resident Inspector
INPO Record Center
CECo Distribution List

(1004R/VS-5)

ATTACHMENT 1 TO 9306110217 PAGE 2 OF 2

LER Number
455: 93-003

Title of Event: Unit 2 Reactor Trip due to Turbine Trip due to Overspeed Trip Actuation caused by a Spiking Power Supply

Occurred: 05-11-93/ 2238
Date Time

Acceptance by Station Review:

OE Date TSS Date

RAS Date OTHER Date

Approved by:
Station Manager Date

(1004R/VS-1)

*** END OF DOCUMENT ***